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ters devoted to the separate groups of bush fruits, and the whole book is so planned that the practical grower may quickly reach replies to the questions in hand by means of a full index even to the varieties of each sort of fruit embraced by the work.

The more scientific portions of the volume are kept as far as possible by themselves, set in smaller type and include histories of the various sorts of fruits, their insect enemies and fungous diseases. This separation is a wise provision for the convenience of the grower, for whom the book is especially written and who is more interested in the art of producing a profitable crop than the underlying principles of botany upon which the art securely rests. For example, there are nearly fifty pages of descriptive text of species of *Ribes* set under the chapter title of 'The Botany of the Groselles,' and many of the species are figured. Such portions of the work as this are of much value to all who desire to advance American horticulture by introducing new species to cultivation or extending the range of hybridization.

In the more practical part it may be noted that special stress is placed upon the evaporation of the fruit, and several illustrations are given of the apparatus employed in this growing industry. In the preface, by the editor of 'The Rural Science Series,' of which the 'Bush Fruits' is the sixth volume, Professor Bailey states that 'the aim has been to treat general truths and principles rather than mere details of practice.'

The book is written by one who has both an experience with bush fruits and a knowledge of the best things that have been thought and said along the lines he has followed out to a successful issue in the volume in hand.

BYRON D. HALSTED.

*The Lower Cretaceous Gryphæas of the Texas Region.* By ROBERT THOMAS HILL and THOMAS WAYLAND VAUGHAN. Bulletin of the United States Geological Survey, No. 151. Washington, Government Printing Office. 1898. Pp. 66. Pl. xxxv.

The main object of the authors in publishing this brochure is to set aright the confusion that has long existed regarding the classification and

stratigraphic position of a series of fossil oysters commonly assigned to a single species, *Gryphæa pitcheri*, Morton. They occur in especial abundance in the Lower Cretaceous formations of Texas, and when properly classified are found to be of great value in determining the position of strata. From forms heretofore known as *G. pitcheri* at least eight species are here recognized (Table, pp. 45-46), viz.: *G. vesicularis*, Lam., 1806; *G. newberryi*, Stanton, 1893; *G. mucronata*, Gabb, 1869; *G. washitaensis*, Hill, 1889; *G. navia*, Hall, 1856; *G. corrugata*, Say, 1823; *G. marcoui*, Hill and Vaughan, 1898; *G. wardi*, H & V, 1898. It is found, furthermore, that even Morton's species (so long considered the type) must be abandoned in favor of Say's *G. corrugata*.

The introduction, dealing historically with the controversy of many years' duration concerning *G. pitcheri* and the formations in which it occurs, is not without a moral, inasmuch as it plainly shows that an inadequate description, with a poor figure, may become a fruitful source of error, which, as in the case of the species under consideration, may be greatly augmented by the want of proper stratigraphical knowledge on the part of collectors.

An account of the fossil oysters of the Texas region and a classification of the Ostreidæ follows. The difficulties encountered by the authors are not underestimated: "In undertaking the study of the Ostreidæ one is soon confronted with the question: What constitutes species and genera in this group? The variation of species is much greater in the Ostreidæ than in other molluscan genera. No other group presents such unsatisfactory criteria for specific differentiation. These forms, judging from their stratigraphic occurrence as well as their habits, seem to adopt new variations of shape with every change in physical condition of habitat, as is illustrated in the variations of our living species. Changes similar to those occurring at the present time have occurred in the past, and no doubt many species have arisen by some of these local variations becoming fixed and persistent. Large suites of specimens often show that two species usually considered very distinct may grade into each other. The intergradations are of such a kind that frequently it can easily

be shown that the two species have been derived from a common ancestor; in other cases one species is evidently derived from another occurring stratigraphically below it."

Contrary to the prevailing opinion that fossil oysters, on account of their great variation, are of little value in the recognition of strata, our authors are led by their observations to conclude "that certain forms of the Ostreidæ possess very distinct specific characters, have definite geologic horizons, and are of the greatest value in stratigraphic work." They recognize the fact, also, that no scheme of classification can be entirely satisfactory until both fossil and recent oysters have been "the subject of thorough investigation from a phylogenetic and morphologic standpoint, according to the lines of research followed out by Hyatt in the cephalopods, Jackson in the pelecypods, Beecher and Schuchert in the brachiopods and Von Koch in the stony corals."

Sixty-one accepted species and varieties of fossil oysters are listed as occurring in the Texas Cretaceous, and twenty-three indefinite and abandoned species. Of the former forty-seven are tabulated as characteristic of definite horizons (p. 31).

Under the caption 'Historical Statement of the Discovery in the Texan Region of the Forms referred to *Gryphæa pitcheri*, Morton,' the confusion of various authors concerning this famous fossil is clearly presented and the sources of error pointed out. The following topics of more than ordinary interest are also discussed: 'Differentiation,' 'Geographic and Stratigraphic Distribution of the Lower Cretaceous Gryphæas,' 'Specific Classification and Evolution of the Lower Cretaceous Gryphæas,' and the bulletin closes with careful descriptions of six species, characteristic of the Lower Cretaceous, which the authors believe to merit recognition, supplemented by a brief statement of their relationship. The excellent and copious illustrations which accompany this paper deserve especial commendation. Of thirty-five plates, thirty, including copies of figures from Hall, Marcou and Roemer, are devoted to Gryphæas; of the remainder, one is a view of a living oyster bed, showing the profusion of molluscan growth, the others sections showing the strati-

graphic occurrence of the Texas Cretaceous Ostreidæ.

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#### BOOKS RECEIVED.

*Calcul de généralisation.* G. OLTRAMARE. Paris, Hermann. 1899. Pp. viii+191.

*Report of the Commissioner of Education for the year 1896-97.* Washington, Government Printing Office. 1898. Vol. II. Pp. 1137-2390.

*The Human Body.* H. NEWELL MARTIN. Fifth Edition, revised by GEORGE WELLS FITZ. New York, Henry Holt & Co. 1898. Pp. xiv+408.

*Elements of Graphic Statics.* PROFESSOR L. M. HOSKINS. New York and London, The Macmillan Company. 1899. Pp. viii+199, and eight plates. \$2.25.

#### SCIENTIFIC JOURNALS AND ARTICLES.

THE *American Naturalist* for January opens with an article by Dr. Arthur Hollick discussing the relation between forestry and geology in New Jersey. Professor W. M. Wheeler gives a biographical sketch of the late George Baur, which is accompanied by a biographical sketch containing 144 titles. Articles follow by Miss Julia B. Platt, describing certain phenomena of geotaxis; by Professor Cockerell, on 'Vernal Phenomena in the Arid Regions,' and by Professor E. W. MacBride, reviewing Seitaro Goto's work on the development of *Asterias pallida*.

THE *American Geologist* for January opens its twenty-third volume with a notice of Edward Drinker Cope, by Miss Helen Dean King, with a portrait and a bibliography containing 815 titles. There follow articles by Dr. N. H. Winchell, on 'Thalite and Bolingite from the North Shore of Lake Superior,' and by Mr. Marsden Monson, on 'The Loss of Climatic Evolution.'

THE *Journal* of the Boston Society of the Medical Sciences for December, 1898, contains an abstract of an interesting paper by Dr. Morton Prince entitled 'An Experimental Study of Visions,' also an important paper by Dr. Franklin W. White upon 'the Germicidal Properties of Blood Serum.' Among the conclusions reached are these: Human blood serum differs greatly in its germicidal action